

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA8406P, TA8406F

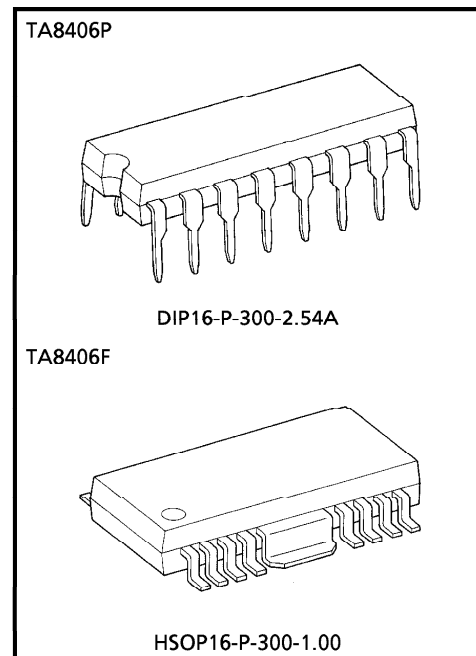
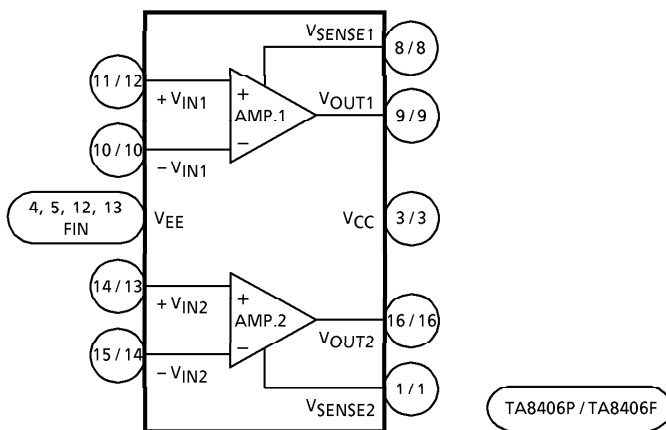
## DUAL POWER OPERATIONAL AMPLIFIER

The TA8406P, TA8406F are dual power operational amplifier.  
 It is intended for use especially DC MOTOR positioning system applications such as Arm Driver (for Audiodisk Players), head or voice coil motor drivers (for Floppy and Winchester Disk Drivers) and any other power driver applications.

### FEATURES

- Built-in over current protector
- Few external parts are required.
- Output current up to 500mA (AVE.) and 1.0A (PEAK)
- Excellent crosstalk characteristics

### BLOCK DIAGRAM



Weight  
 DIP16-P-300-2.54A : 1.11g (Typ.)  
 HSOP16-P-300-1.00 : 0.50g (Typ.)

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**PIN FUNCTION**  
TA8406P

| PIN No. | SYMBOL  | FUNCTION DESCRIPTION                    |
|---------|---------|---|
| 1       | VSENSE2 | AMP.2 output current detection terminal |
| 2       | NC      | No connection                           |
| 3       | VCC     | Positive side voltage terminal          |
| 4       | VEE     | Negative side voltage terminal          |
| 5       | VEE     | Negative side voltage terminal          |
| 6       | NC      | No connection                           |
| 7       | NC      | No connection                           |
| 8       | VSENSE1 | AMP.1 output current detection terminal |
| 9       | VOUT1   | AMP.1 output terminal                   |
| 10      | -VIN1   | AMP.1 negative input terminal           |
| 11      | +VIN1   | AMP.1 positive input terminal           |
| 12      | VEE     | Negative side voltage terminal          |
| 13      | VEE     | Negative side voltage terminal          |
| 14      | +VIN2   | AMP.2 positive input terminal           |
| 15      | -VIN2   | AMP.2 negative input terminal           |
| 16      | VOUT2   | AMP.2 output terminal                   |

TA8406F

| PIN No. | SYMBOL  | FUNCTION DESCRIPTION                    |
|---------|---------|---|
| 1       | VSENSE2 | AMP.2 output current detection terminal |
| 2       | NC      | No connection                           |
| 3       | VCC     | Positive-side voltage terminal          |
| 4       | NC      | No connection                           |
| 5       | NC      | No connection                           |
| 6       | NC      | No connection                           |
| 7       | NC      | No connection                           |
| 8       | VSENSE1 | AMP.1 output current detection          |
| 9       | VOUT1   | AMP.1 output terminal                   |
| 10      | -VIN1   | AMP.1 negative input terminal           |
| 11      | NC      | No connection                           |
| 12      | +VIN1   | AMP.1 positive input terminal           |
| 13      | +VIN2   | AMP.2 positive input terminal           |
| 14      | -VIN2   | AMP.2 negative input terminal           |
| 15      | NC      | No connection                           |
| 16      | VOUT2   | AMP.2 output terminal                   |
| FIN     | VEE     | Negative side voltage terminal          |

**MAXIMUM RATINGS (Ta = 25°C)**

| CHARACTERISTIC        |         | SYMBOL           | RATING       | UNIT |
|-----------------------|---------|------------------|--------------|------|
| Supply Voltage        |         | $V_{CC}, V_{EE}$ | $\pm 18$     | V    |
| Output Current        |         | $I_O$ (AVE.)     | 0.5          | A    |
| Power Dissipation     | TA8406P | $P_D$            | (Note 1) 1.4 | W    |
|                       |         |                  | (Note 2) 2.7 |      |
|                       | TA8406P |                  | (Note 3) 1.4 |      |
| Operating Temperature |         | $T_{opr}$        | - 30~75      | °C   |
| Storage Temperature   |         | $T_{stg}$        | - 55~150     | °C   |

(Note 1) No heat sink

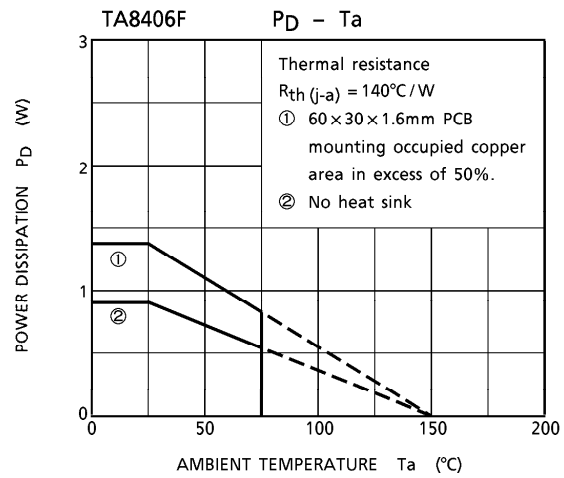
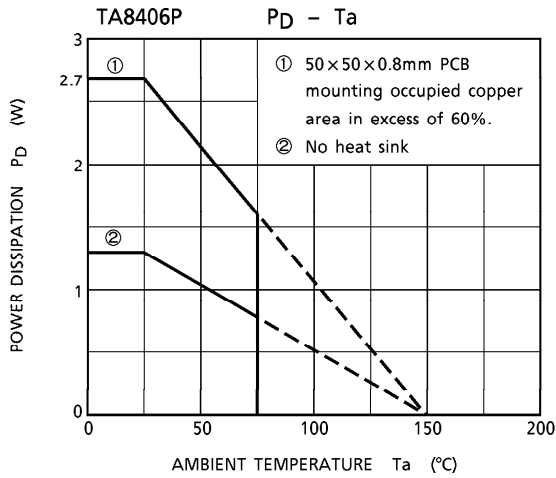
(Note 2) This value is obtained by 50×50×0.8mm PCB mounting occupied in excess of 60% of copper area.

(Note 3) This value is obtained by 60×30×1.6mm PCB mounting occupied in excess of 50% of copper area.

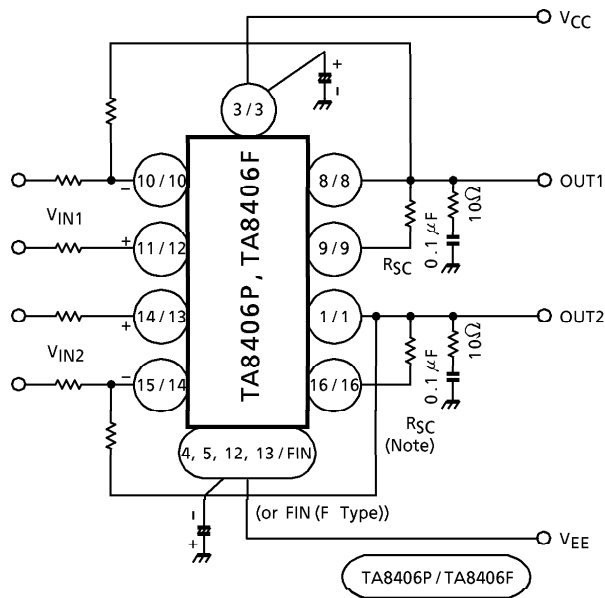
**ELECTRICAL CHARACTERISTICS**

(Unless otherwise specified,  $V_{CC} = 15V, V_{EE} = -15V, T_a = 25^\circ C$ )

| CHARACTERISTIC                  |       | SYMBOL   | TEST CIR-CUIT | TEST CONDITION  | MIN.     | TYP.     | MAX. | UNIT        |
|---------------------------------|-------|----------|---------------|---|----------|----------|------|-------------|
| Quiescent Current               |       | $I_{CC}$ | —             | —   | —        | 10       | 20   | mA          |
| Input Off Set Current           |       | $I_{IO}$ | —             | —   | —        | 10       | 200  | nA          |
| Input Bias Current              |       | $I_I$    | —             | —   | —        | 100      | 700  | nA          |
| Input Off Set Voltage           |       | $V_{IO}$ | —             | —   | —        | 2        | 6    | mV          |
| Output Voltage Swing            | Upper | $V_{OH}$ | —             | $R_L = 33\Omega$                                      | 12       | 13.0     | —    | V           |
|                                 | Lower | $V_{OL}$ |               |   | - 12     | - 13.0   | —    |             |
| Open Loop Gain                  |       | $G_{VO}$ | —             | —   | —        | 100      | —    | dB          |
| Input Common Mode Voltage Range |       | CMR      | —             | —   | $\pm 12$ | $\pm 14$ | —    |             |
| Common Mode Rejection Ratio     |       | CMRR     | —             | —   | 70       | 90       | —    | dB          |
| Supply Voltage Rejection Ratio  |       | SVRR     | —             | —   | —        | 50       | 150  | $\mu V/V$   |
| Band Width                      |       | $f_T$    | —             | Open loop   | —        | 1.0      | —    | MHz         |
| Slew Rate                       |       | SR       | —             | $G_V = 0, R_L = 33\Omega, R = 10\Omega, C = 0.1\mu F$ | —        | 0.15     | —    | V / $\mu s$ |
| Short Circuit Current           |       | $I_{SC}$ | —             | $R_{SC} = 2.2\Omega$                                  | —        | 0.35     | —    | A           |
| Cross Talk                      |       | CT       | —             | $R_L = 33\Omega, V_{OUT} = 1V_{p-p}$                  | —        | 60       | —    | dB          |

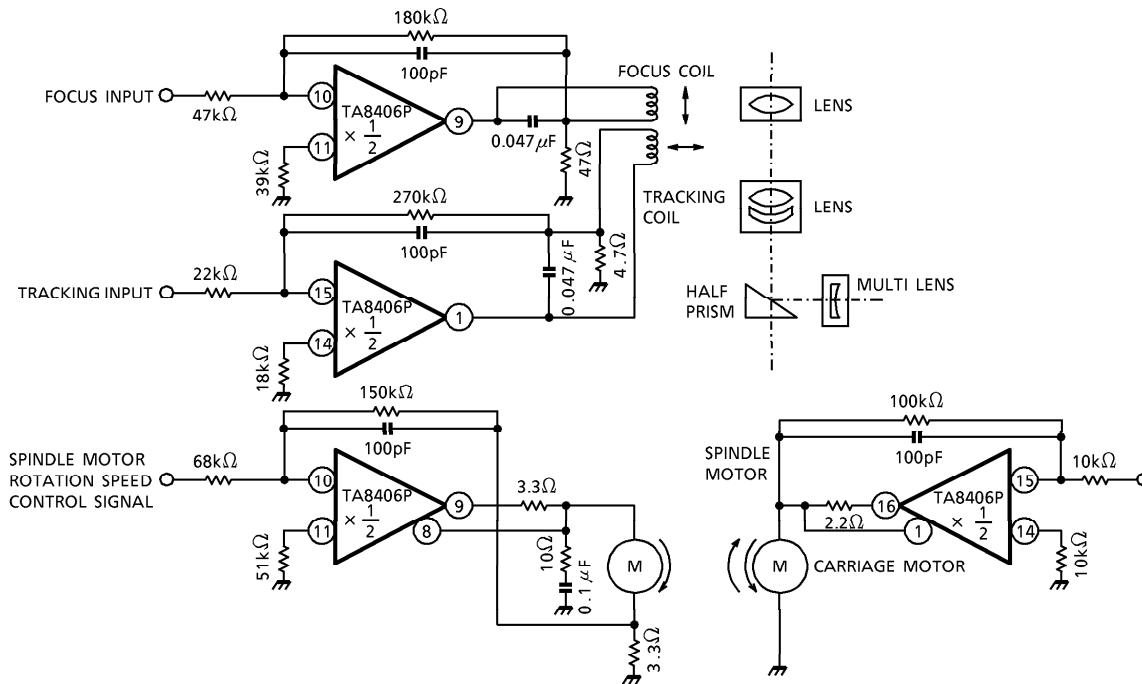


APPLICATION CIRCUIT 1



(Note)  $I_{SC} \doteq \frac{0.77(V)}{R_{SC}(\Omega)} (A)$

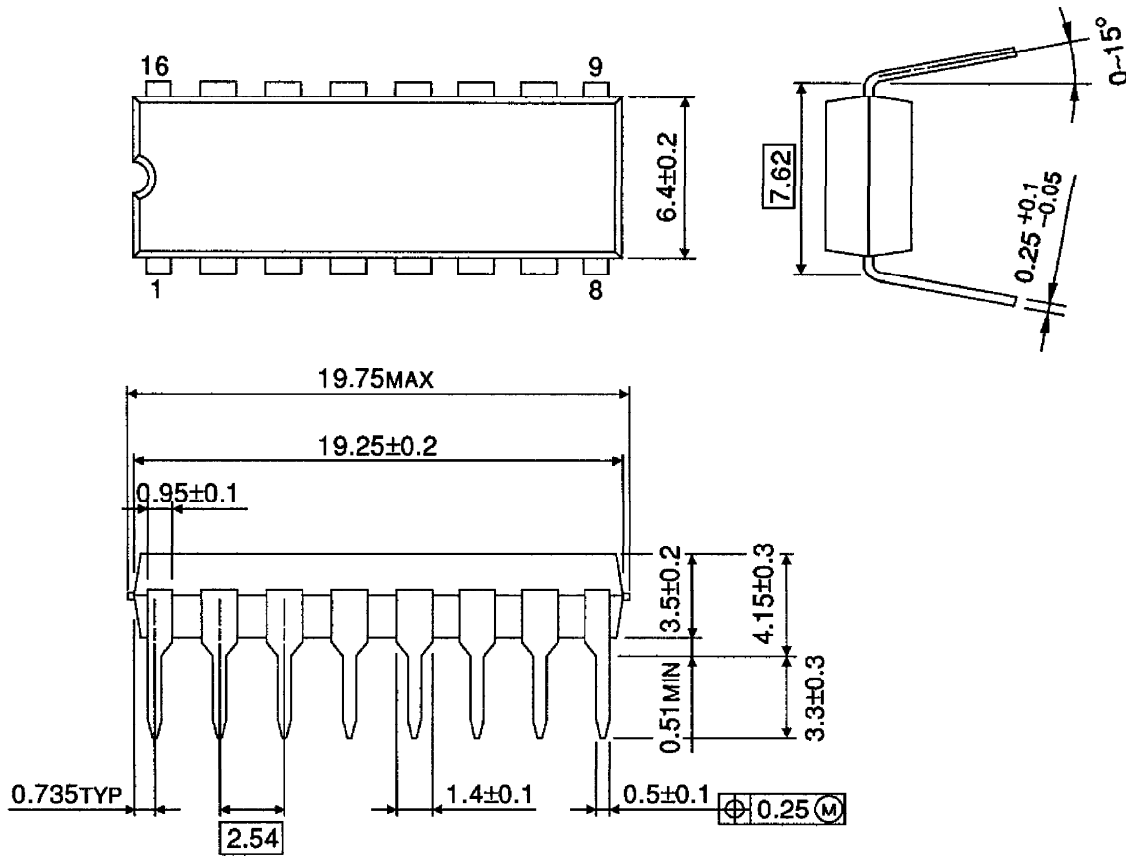
APPLICATION CIRCUIT 2 (Compact disk player motor system)



(Note) Utmost care is necessary in the design of the output line, V<sub>CC</sub>, V<sub>EE</sub> and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

OUTLINE DRAWING  
DIP16-P-300-2.54A

Unit : mm

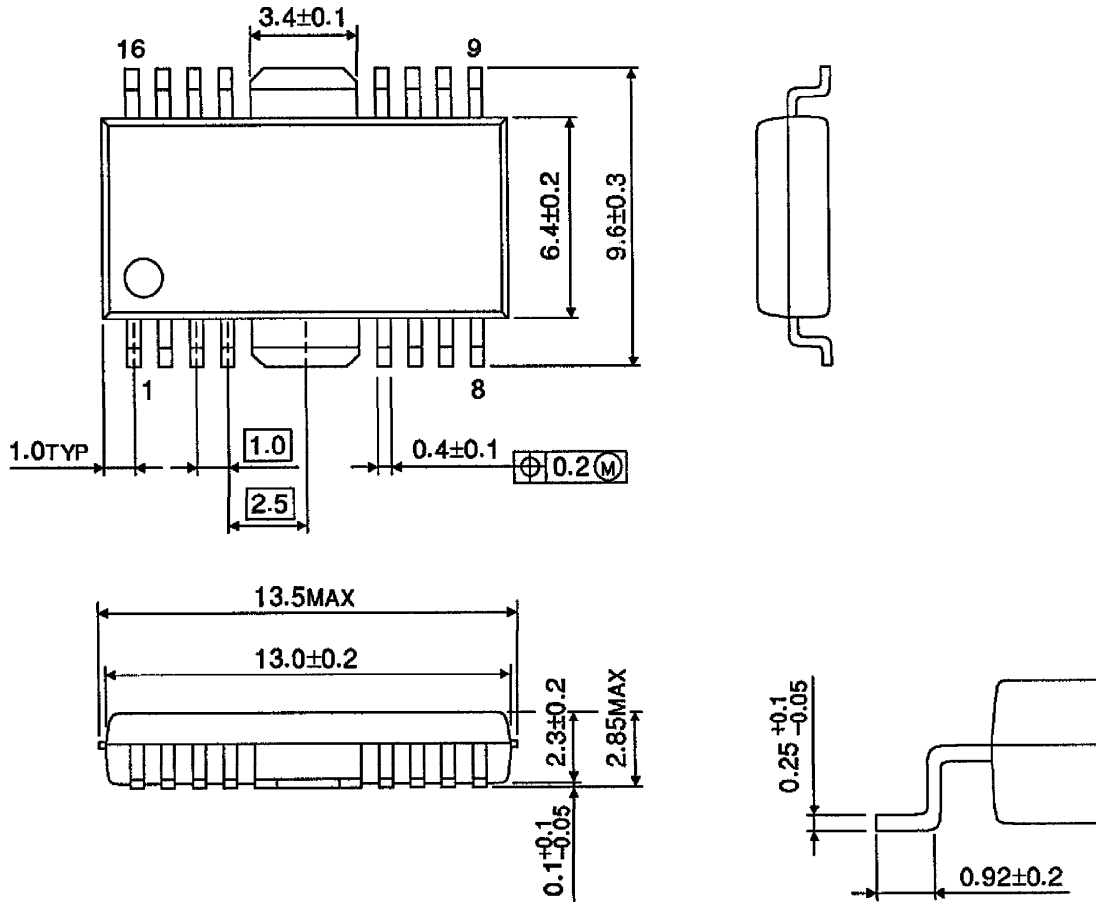


Weight : 1.11g (Typ.)

OUTLINE DRAWING

HSOP16-P-300-1.00

Unit : mm



Weight : 0.50g (Typ.)